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BANANAS

IN

THE WEST INDIES



BY

H. C. HENRICKSEN.

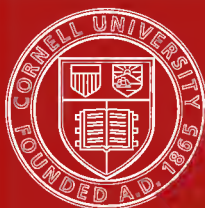
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Banana Cultivation and Fertilization in the West Indies.

BY H. C. HENRICKSEN.

IN the West Indies the banana is, without exception, the most important food plant. The fruit constitutes one of the chief articles of commerce in every market from Porto Rico to Demerara. [Other tropical fruits may be had in season,] the supply of root crops also fluctuates according to season; but the banana season is 365 days. Beside being of inestimable value for home consumption, the banana is gradually becoming one of the export crops in several islands. The value of bananas imported into the United States has increased from about a half a million dollars in 1880 to about eight million dollars in 1904. Jamaica, Costa Rica, Nicaragua and Honduras supply most of the fruit. Some come from Cuba, and this year a line of steamers have started to carry bananas from Surinam. Some of the British Islands are inaugurating a banana trade with Canada and Great Britain, and with proper handling of the business the West Indian trade should greatly increase the consumption of bananas in Europe. The three chief factors in banana growing for export are soil, climate, and transportation.

Soil.—The ideal banana soil is one containing an abundance of moisture without being subject to periodical droughts, an abundance of humus and plant food, and so situated that it is, or can be, drained. These ideal

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Banana Plant with undeveloped Fruit on account of poor, dry soil.

conditions are seldom combined in the West Indies, but most islands possess means to create such conditions artificially.

The humus, while it is desirable, is not absolutely essential, because most of the soil-producing bananas in Jamaica contains but very little humus. The typical soil in the Annatto Bay and Port Antonio districts, on the north coast, is a rather heavy clay, but the most profitable plantations are on soils of a loamy consistency.

Soils which have produced bananas for years, and which used to produce a great many—twelve to fourteen hand-bunches with fingers—like the Bluefields, are now producing smaller bunches, and the size of the individual fruit has decreased. The causes for this are undoubtedly that the physical conditions of the soil are not as favourable for the banana as when the land was virgin, and that the available plant food is exhausted.

Water.—There seems to be no exact data on the amount of water actually necessary to produce a bunch of bananas, but from all indications the banana needs a great deal of water, probably as much as sugar-cane, which was found by Maxwell in Hawaii to be from 75 to 100 gallons per pound of sugar. Bananas succeed well under irrigation. In Jamaica, near Spanish Town,¹ there were on March 31st 8,300 acres of bananas under irrigation, for which 11,376 cubic yards of water per hour were being used.

Temperature.—While the banana is, strictly speaking, a food in the West Indies, it is used in the north as a desert, and must, therefore, compete with whatever desert fruits that may happen to be in the market. For

¹ "Handbook of Jamaica, 1908."



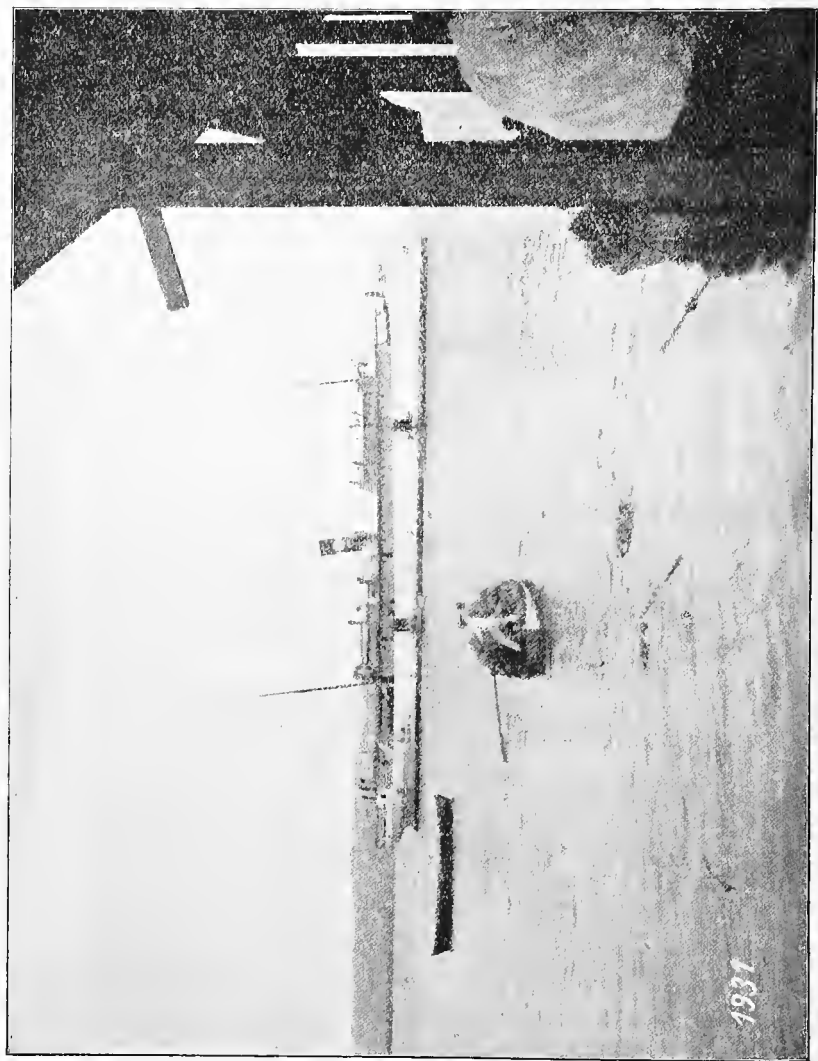
Fourteen-hand bunches produced in soil rich in plant food.

obvious reasons the greatest demand for bananas is from December to May, and that is the time to sell and obtain a fair price. In order to produce fruit that will be marketable at that time of the year the temperature must be tropical in every sense of the word, because a few days cold weather will spoil all calculations.

Wind.—Another factor, when selecting a locality, is the wind. Strong winds are ruinous to the banana plantation. The large leaves of the banana plant are necessary for the making of strong plants and first-class bunches of fruit. Therefore, when cut into ribbons by the wind, vitality is lost and the growth is checked.

A Bunch of Bananas.—In Jamaica, a bunch is nine hands ; three-quarters of a bunch, eight hands ; and a half-bunch, seven hands. This year, the price paid to growers was about sixty cents per bunch in the winter months, with declining prices as the season advanced. It needs no argument to show the necessity for full branches. While nine hands sold for sixty cents, the decrease of one hand cut the price to forty-five cents, and the decrease of two hands cut the price in half. After July 15th, the bunch usually sells for less than twenty-five to thirty cents, and the halves and the quarters are almost unsaleable.

Bringing the question down to a business basis we find two factors involved, viz., time of maturity and size of the bunches. The time of maturity can be regulated by the time of planting, provided all the conditions are normal. A plantation which is not subject to high winds, or colds, or drought, will, in a certain locality, mature fruit in a given time after planting. Say that the normal time is ten to fourteen months, then the plants should be set the latter part of January or the



Shipping Bananas for the United States, Amolita Bay, Jamaica.

first part of February. The suckers for the second crop should be timed also. If a sucker appears so early as to mature fruit before December, it should be cut out and a smaller one left to produce the next crop.

* The determination of the size of the bunch is probably less understood by the average planter than any other question connected with the business. The fruit bud of the banana is familiar to everyone living in the tropics. It appears through the top of the stem, bends over and hangs down, resembling a bottle. Later, the dark fleshy bracts open and curl up, leaving the flowers exposed. Of the flowers there are two kinds, the female or those which develop into fruit, and the male or those which do not develop into fruit. The first kind are the ones first exposed, and after the bracts have dropped the number of hands can be counted. The bunch of flowers remaining uncovered is not fruit producing, and is, as a matter of fact, superfluous to the cultivated banana. We therefore see that the size of the bunch depends on the number of fruit-producing flowers. We do not know the exact time at which it is determined what the flowers will be, but we know that it is long before the appearance of the fruit bud, and nothing can be done after that to change the number of hands or fingers, although the size of the individual fruit may be influenced. It is clear, therefore, that in order to produce large bunches we must commence early. The first thing is a thorough preparation of the soil, and the second a generous amount of plant food.

Nitrogen is the food element of which the banana has immediate need for the production of the large leaves and the leaf bases of which the stem is composed. But what is especially needed is potash. According to Professor Hilgard, former Director of the California



Banana Plantation near Havana, Cuba, planted with cow peas as cover crop.

Experiment Station,¹ the potash content of banana ash is 63·066 per cent., while the phosphoric acid content is only 1·620 per cent. The ashes of the leaves contain 27·552 per cent. potash, and only 0·638 per cent. phosphoric acid. From the ash analysis, the percentage in the fresh material is calculated to be: fresh fruit 0·68 per cent., and fresh leaves, 0·505 per cent. potash. With a yield of 500 bunches per acre, each bunch weighing 80 lb., equal to 40,000 lb. with a potash content of 0·68 per cent., we have an annual loss of 272 lb. of potash in the fruit alone. Beside that there is a loss of nearly 3 lb. of potash for every 100 lb. of dry leaves removed, which in a great many fields amounts to 1,000 lb., making the total loss of potash for one crop about 300 lb. This would indicate that all we need to do is to apply 600 lb. of sulphate of potash, or 800 lb. for good measure, and just sit down and wait for the fourteen hand bunches to appear with every finger as big as a plantain. But that deduction is far from being correct, which was thoroughly shown by the large number of careful experiments conducted by the Hon. H. H. Cousins, now Director of Agriculture in Jamaica.² We may take as an example the experiment at Huntly, Brown's Town, quoted on p. 13, where eight plots with manure in different forms and quantities were under observation. Mr. Cousins says:—

“The total phosphoric acid in the soil is high, although the availability is low. The potash is not high. The humus and nitrogen appear to be normal for a good soil. . . . The results from the manures were uniformly bad. No marketable

¹ “Report Agricultural Experiment Station, California,” 1902-3, p. 277.

² *Bulletin Department of Agriculture*, January, vol. i.; part 1, 1903.



Bananas on the Wharf, Port Antonio, Jamaica.

crops were obtained during the year; the bananas apparently failed completely. . . . My opinion is that the manures were not concerned in the results obtained, but that the failure to grow bananas is due to other causes than a deficiency in plant food."

This is evidently the keynote to the failure to fertilizer experiments in general. We know that our plants need certain plant foods. We buy a fertilizer at so much per ton and pay good hard-earned cash for it, and "whistle" for the return of the "siller." But plants are, after all, not much different from people. We may eat roast beef three times a day and not gain enough strength to do a day's work if we sleep in damp, dark, ill-ventilated quarters. We may give the plants all the food they want and the kind we know they need, but we must realize that they are living forms. We must drain the soil if it needs draining, apply lime if it is sour, work it if it is hard—not alone a few inches on the surface, but deep down; not alone in a hole a foot or two in circumference, but the whole field. A field planted with bananas 9 by 9 ft. or 10 by 10 ft. should have the feeding roots extending all through it. We must not carry off the trash unless we practise rotation and supply other vegetable matter to the soil, because without that no amount of work will keep it porous and no amount of fertilizer will produce a crop. We must not forget the water. Plant roots absorb food in a very dilute watery solution. The water is given off by the leaves through transpiration and a constant movement of food is kept up. This movement, which results in growth, is naturally very rapid in the banana because of the large leaf surface, therefore, unless there is an abundant and constant water supply the food is not absorbed and the growth is retarded.



Unloading Banana Wagon, Annetta Bay, Jamaica.

In the heavy clay soils of Porto Rico bananas are greatly benefited by mineral manures, and under favourable conditions most banana soils in the West Indies would respond to a manure containing per acre 200 lb. sulphate of potash, 250 lb. sulphate of ammonia, 450 lb. acid phosphate.

Transportation.—The only limit to banana production in the West Indies at the present time is transportation. Jamaica produces bananas in mountain valleys at considerable distances from railroad or port, but in such places the network of magnificent roads makes it possible to transport the fruit in large waggons drawn by mules or oxen; and, speaking of oxen, it would be a revelation to other West Indian ox-drivers to see the banana waggons with from three to four yokes of oxen driven at a speed equal to that of a carriage.

In Porto Rico a certain amount of bananas could be grown for export if there were enough good roads. Guadeloupe could produce enough bananas to supply the market of France. Several of the British islands could produce bananas and compete with the Canaries, but it means more than local transportation. The banana trade of Jamaica and Central America would not have been what it is if it had not been for the business acumen and sagacity of the United Fruit Company, and other concerns engaged in shipping bananas. There are no secret or complicated methods—it is simply a question of business being done in a businesslike way. The bunches are cut, wrapped in trash (sometimes not wrapped), and placed in waggons in horizontal layers. They are then hauled to the train or direct to the seaport, where they are unwrapped and placed in horizontal layers in sheds built on the wharves. From the wharves they are loaded



Banana Plantation near Port Antonio, Jamaica.

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directly on the steamers or lightered out, frequently the latter. In the ship the bananas are placed on end. No refrigeration is used. The ships are not exceptionally fast and were not built especially for this trade. Any of the regular lines plying in the West Indies would carry bananas successfully if handled with reasonable care.

The great trouble is, and always has been, that unless the business is extensive enough no company cares to handle it in a way that would be satisfactory to the planter. It should also be remembered that not all bananas carry as well as the Jamaica or Bluefield variety. Of eighty or more varieties tried at the Porto Rico Experiment Station, there were very few that would keep over two weeks even with the best of care.

Space will not allow me to treat the question of banana flour, but it seems to be a promising field and one well worth considering.

Those interested in Tropical Agriculture can obtain further copies of this Bulletin, as well as of other Publications, including:—

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